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ABSTRACT

Physical linguistics is defined as the use of treatments from the field of speech pathology to enhance first and second language production in healthy individuals, resulting in increased quality and strength of phonation and articulation. A series of exercises for treating dysarthria (weakness, paralysis, discoordination, primary and secondary sensory deprivation, and alteration in tone of speech musculature), drawn from speech pathology texts, is outlined. Materials needed include tongue depressor, sterile gauze pads, and sterile rubber gloves. Theory underlying the treatments, areas to be improved by use of the exercises, determination of baseline performance, need, and objectives, and methods of recording procedures are discussed, and the procedures themselves are described. Forms for charting progress in tone improvement and strengthening throughout treatment are appended. (MSE)

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PHYSICAL LINGUISTICS

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ED 417 610

Abstract

The use of treatments usually associated with 'motor speech disorders' that effect the phonation, articulation, resonation, and prosody of speech and are of a neuropathologic origin. These same speech processes also have to be balanced in healthy individuals and so the use of treatments from speech pathology to correct and strengthen articulators for proper articulation in individuals learning a language can compliment the rate and quality of the production of sound of that language.

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Introduction

The exercises examined in this demonstration are classified in speech pathology treatment as corrections for dysarthrias; the weakness, paralysis, discoordination, primary and secondary

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sensory deprivation, and alteration in the tone of the speech musculature (Dworkin, 1991: 5-6).

We will be focusing on the use of these treatments to strengthen the tongue and for tone reduction of the tongue.

It is important to note that not all individuals will need strengthening exercises and this can be analyzed from an initial evaluation of the individuals articulators. Also, the rate of improvement, if there is any improvement at all, will be based on the accuracy of the diagnoses, the treatment, the motivation of the patient and the individual idiosyncrasys that make up each individual human being. If a series of exercise are not working, move on to ones that will.

The term 'physical linguistics' is the name for the pairing of speech pathology treatments to enhance language production in healthy individuals by the means of physical process or tools not usually associated with language acquisition training. This area is a hybrid area of applied lingusitics and speech pathology and the results are an increase in quality and strength of phonation and articulation.

Method and Materials

The methods employed in these exercises are from speech pathology texts and a list of the materials are as follows.

1. Tongue Depressors

2. Sterile Gauze Pads 3x3 inch.

3. Sterile Rubber Gloves

Theory

Because the treatments covered are for dysarthria all exercises will be focusing on facilitating the "physiologic integrity of the coordination between the disturbed speech subsystems or training compensatory skills."(Dworkin, 1991: 27). Specifically, in the non-dysarthria subject, the treatment is to strengthen the articulators and promote flexability of the articulators in producing new sounds.

The following are a list of areas to be improved by the use of these exercises (Dworkin, 1991: 27).

1. Promote oral motor development

2. Promote adequate body and orofacial postures.

3. Promote integration of primitive and higher-level orofacial reflexes.

4. Promote reduction of increases in orofacial muscle tone.

5. Increases in orofacial muscle strength.

6. Improves range, speed, timing and coordination of orofacial muscle contractions and movements.

Application

It is not sufficient to just administer treatments for without integrating a design to measure and test treatment efficiency, the clinician has no means of determining whether the therapy has worked. Such actions require methods that are objective, measureable, replicable, and empirical to illustrate a direct cause and effect relationship (Dworkin, 1991: 19).

To this end treatment objectives and outcomes are designed around the patient and are recorded on a chart. The first order of business is to record the baseline data, pre-treatment data, on the behavior to be treated (Dworkin, 1991: 23).

General Guidelines for Examination (Duffy, 1995: 64-67).

a.) History of Subject- physical problems, medical history, languages learned.

b.) Salient Features- speech characteristics such as speed, range, steadiness and accuracy.

c.) Confirmation of Signs- direct muscle observation and muscle stretch reflexes.

Baseline Data

Baseline data is pre-treatment data on behavior to be treated. All scores are arbitrary and can be adjusted to fit subject's condition.

Charts

Chart all of the subjects performances from pre, para, and post-therapies. There are two sample blank charts to use in this demonstration a.) Tone Improvement Chart, that is to be used for testing tongue hypertonicity and b.) Strengthening Chart, that is to be used with resistence blocks.

The Tone Improvement Chart is composed of the following

1.)Entries for dates of treatments: Date of the treatment.

2.)A subjective scale for measuring the articulator: A scale that goes from +4, very increased, to -4, very decreased with 0 being a normal level.

3.)Number of trails: The number of trails or tests done during that session.

4.)Musculature: Articulator to be tested.

5.)Type of activity: Type of activity or testing being preformed.

6.)Target criterion: Expected outcome.

The Strengthening Chart is composed of the following.

1.) Dates: Date of treatment.

2.) Subjective ranking: Scale for measuring strength. A scale from +4, very strong, to -4, very weak with 0 being normal.

3.) Number of trials: The number of trials or tests during that session.

4.) Musculature: Articululator to be tested.

5.) Vector: Activity being performed.

6.) Target Criterion: Expected outcome.

Demonstrations

The demonstrations will be 1.) Tongue Hypertonicity Exercise 2.) Resistence Blocks for a.) Anterior Tongue Strengthening and b.) Right and Left Laterial Strengthening.

Tongue Hypertonicity Exercise (Evaluation Stage only).

The subject will stick out their tongue so that it can be gently grasped with a gauze pad by the clinician. Once the tongue is positioned and secured in this manner, instruct the patient to relax as much as possible to allow the tongue to be (passively) pulled slowly forward and laterially to measure the inherent tissue elasticity. Maintain the tongue in each manipulated

direction for at least 3 seconds.

Repeat this technique three times before rendering a baseline rating of overall muscle tone on the Tone Improvement Chart, which is based on a popular used scale ranging from +4 to -4. To record these baseline data, enter on the y-axis grid the perceived degree of muscule tone, making certain to list the date of data collection, the number of trails,(3), the musculature tested ("T" for tongue), and the activity (BF1, BR?L1), indicating forward and laterial tone baselines. A score of +1.5 or higher is generally a prescription for tone reduction treatment (Dworkin, 1991: 194-195).

Resistence Blocks for a.) anterior tongue evaluation and strengthening and b.) right and left laterial tongue evaluation and strengthening.

For anterior baseline measurement make certain that the upper and lower borders of the tongue depressor are positioned between the patient's upper and lower incisor teeth so the the flat edge is in close contact with the tip of the tongue at rest. Request that the subject push against this surface with the tongue-tip as hard as the thumb exerts external resistence.

Apply enough counterforce to prevent protrusion of the tongue-tip beyond the cutting edges of the teeth. As the subject pushes against the stick for about 5 seconds, rate the overall degree of force exerted. Record the results as the mean score on the Strengthening Chart (Dworkin, 1991: 208-209).

For right lateral baseline measures, make certain that the index and middle fingertips are pressed firmly against the patient's right cheek as he or she is requested to push the tongue-tip as hard as possible into the cheek with the objective of overcoming this external resistence. Apply sufficient counterforce to prevent the patient's cheek from bulging significantly outward. Note the degree of lateral force exerted over the course of 5 seconds. Repeat this procedure several times and follow the scoring and charting method recommended above for anterior measurement, except that here use the activity (vector) symbol "BR1" to represent these baseline findings (Dworkin, 1991: 209).

For left lateral baseline measures, follow exactly the same method as for the right side, except that these data are represented by the activity symbol "BL1" on the Strengthening Chart (Dworkin, 1991: 209).

Treatment to strengthen anterior and laterial tongue articulations

The same treatment that is used to evaluate the anterior tongue articulator strength is also the treatment. A recommended number of trials per session for each articulator is 10.

Again the same 'resistence' type training for the laterial tongue articulator by having the subject apply resistence externally to cheek with finger tips to counter tongue force. A recommended number of trials per session for each articulator is again limited to 10.

Summary

With proper motivation, analysis and application of treatments, an increase in both tone quality and articulation strength will result from the proper use of these speech pathology treatments and will be a worth while aid in producing quality target language sound patterns.

References

Duffy, J.R. (1995). Motor Speech Disorders: Substrates, Differential Diagnosis, and Management. New York: Mosby Year Book, Inc.

Dworkin, J.P. (1991). Motor Speech Disorders: A Treatment Guide. Boston: Mosby Year Book, Inc.

TONE IMPROVEMENT CHART

Patient's name: _____

Birthdate: _____ Sex: _____

Speech diagnosis: _____

Medical diagnosis: _____

Clinician: _____

Facility: _____

Address: _____

ACTIVITY KEY

1. Musculature: Tongue (T); Lip (L); Velum (V); Jaw (J)
2. Activity: Forward tongue pull (F); Lateral tongue pull (R/L); Up/Down lip pull (U/D); Open/Close jaw excursions (O/C); Velar Massage (A/P)

Baseline (pre-treatment): B + feature symbol

Comments:

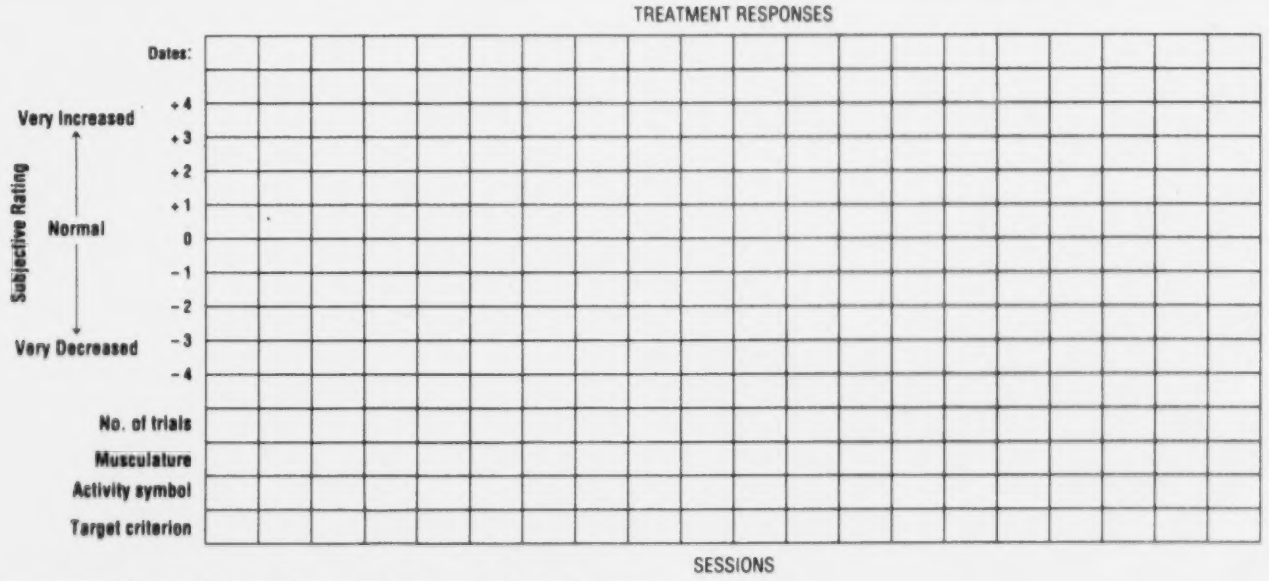

Figure 6–3. Blank Tone Improvement Chart to be used for articulator tone reduction therapy.

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STRENGTHENING CHART

Patient's name: _____

Birthdate: _____ Sex: _____

Speech diagnosis: _____

Medical diagnosis: _____

Clinician: _____

Facility: _____

Address: _____

ACTIVITY KEY

1. Musculature: Tongue (T); Lip (L); Jaw (J)
2. Vectors: Anterior (A); Right (R); Left (L); Palatal (P); Open/Close (O/C)

Baseline (pre-treatment): B + feature symbol

Comments: _____

TREATMENT RESPONSES

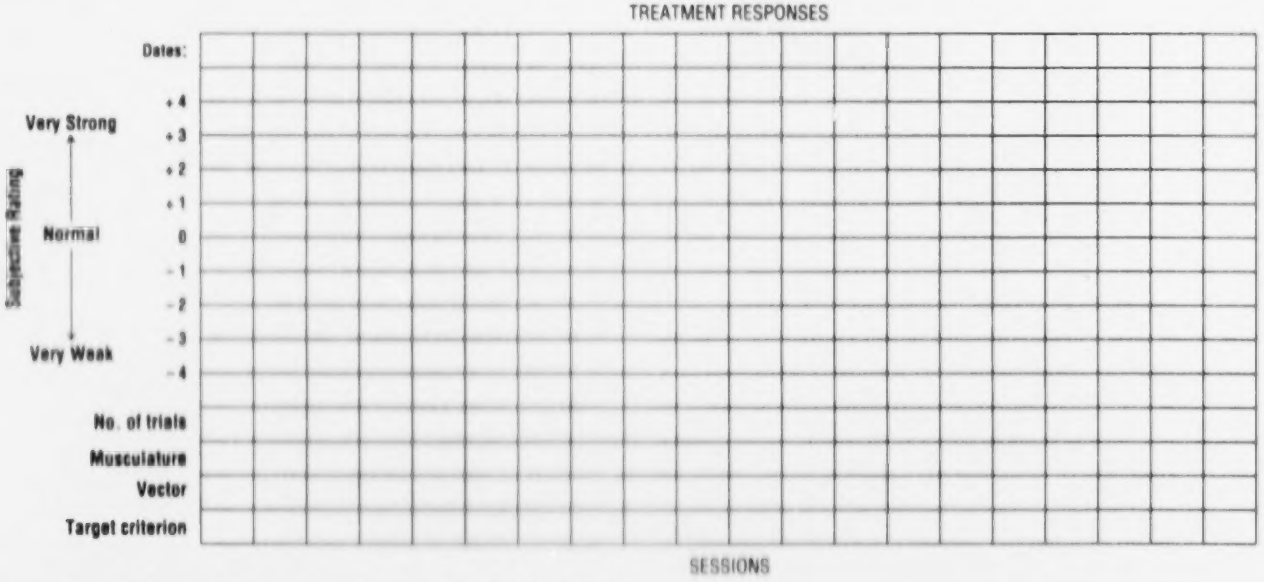

Figure 6–13. Blank Strengthening Chart to be used to increase the strength of articulators.

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